Claims

1. A method for fiberizing particularly paper and/or paperboard based material, for feeding a fiberized material, such as pulp wool, wood fiber or the like, subsequently to a further process, such as its application site, intermediate storage, shipping and/or the like, the fiberization being performed by means of a pulper (1), which is provided with a primary space (A) for processing the material to be fiberized with a knife assembly (1a) included therein and rotating on a driving shaft (s), the material to be processed being forced, in order to fiberize the same, in response to its rotary motion (w) through a screen assembly (1b) associated with, such as surrounding the knife assembly (1a), into a secondary space (B) present in the pulper (1), for supplying the fiberized material further through an expulsion opening (UA) of the pulper (1) to further processing, and said knife assembly (1a) comprising a primary knife unit by which a material to be fed into the pulper (1) is pretreated for fiberization in a so-called integrated manner in conjunction with fiberization, **characterized in that** the material to be fiberized is preprocessed with at least a two-membered (1a'1, 1a'2) primary knife unit (1a'), whereafter it is fiberized by forcing it to pass first between vanes (1a"1) included in a secondary knife unit (1a") and disposed in overlying positions divergent relative to each other, and secondly through the screen assembly (1b), such as a mesh, a grate, a perforated plate and/or the like, spaced in a radial direction from the secondary knife unit (1a") by a clearance (v).

2. A method as set forth in claim 1, **characterized in that** the material to be fiberized is preprocessed, such as worked up and comminuted, by

first knife members (1a'1) included in the primary knife unit (1a'), which are disposed in a plane substantially coincident with the vanes (1a"1) of the secondary knife unit (1a") for rotation together therewith, and by second knife members adapted to be integral with the first knife members (1a'1) and to protrude therefrom in a direction essentially away from the knife assembly (1a), such as to be perpendicular to the first knife members (1a'1).

3. A method as set forth in claim 1 or 2, **characterized in that** the fiberized material having migrated through the screen assembly (1b) into the secondary space (B) is passed in response to the rotary motion (w) of the knife assembly (1a), such as in response to a centrifugal force and/or an overpressure, through the pulper's expulsion opening (UA) to further processing.

4. A method as set forth in any of the preceding claims 1 or 3, wherein the fiberization is performed essentially as a dry process, **characterized in that** the material to be fed into the pulper (1) and/or to be fiberized therein is supplied with one or several additives (XY), such as boric acid, borax and/or the like, particularly for enhancing the thermal/fire resistance properties, decay resistance properties and/or the like of a resulting product, such as pulp wool, wood fiber or the like to be used as thermal insulation.

5. A method as set forth in any of the preceding claims 1-4, **characterized in that** the material to be fiberized and/or the additive (XY) is fed to the fiberization process from a supply assembly (x1) in connection with the pulper (1), such as from one or several supply pockets (x11), supply openings (x12) and/or the like, in response to an underpressure

provided essentially by the rotary motion (w) of the knife assembly (1a).

6. An apparatus for fiberizing particularly paper and/or paperboard based material, for feeding a fiberized material, such as pulp wool, wood fiber or the like, subsequently to a further process, such as its application site, intermediate storage, shipping and/or the like, said apparatus comprising a pulper (1), which is provided with a primary space (A) and a knife assembly (1a) included therein and rotating on a driving shaft (s), by which the material to be processed is adapted to be fiberized by forcing it in response to a rotary motion (w) of the knife assembly (1a) through a screen assembly (1b) associated with, such as surrounding the knife assembly, into a secondary space (B) present in the pulper (1), for supplying the fiberized material further through an expulsion opening (UA) of the pulper (1) to further processing, and said knife assembly (1a) comprising a primary knife unit for pretreating a material to be fed into the pulper (1) for fiberization in a so-called integrated manner in conjunction with fiberization, **characterized in that** a primary knife unit (1a') included in the knife assembly (1a) is adapted to consist of at least two members (1a'1, 1a'2), and that a secondary knife unit (1a") consists of vanes (1a"1), disposed in overlying positions divergent relative to each other, for performing fiberization by forcing the material preprocessed with the primary knife unit (1a') to pass first through the secondary knife unit (1a") and secondly through the screen assembly (1b), such as a mesh, a grate, a perforated plate and/or the like, spaced in a radial direction from the secondary knife unit (1a") by a clearance (v).

7. An apparatus as set forth in claim 6, **characterized in that** its primary knife unit (1a') comprises first knife members (1a'1), which are intended particularly for preprocessing, such as working up and comminuting the material to be fiberized and which are disposed in a plane substantially coincident with the vanes (1a"1) of the secondary knife unit for rotation together therewith, and second knife members (1a'2) adapted to be integral with the first knife members (1a'1) and to protrude therefrom in a direction essentially away from the knife assembly (1a), such as to be perpendicular to the first knife members (1a'1).

8. An apparatus as set forth in claim 6 or 7, **characterized in that** the fiberized material having migrated through the screen assembly (1b) into the secondary space (B) is adapted to pass through the pulper's expulsion opening (UA) to further processing essentially in response to the rotary motion (w) of the knife assembly (1a), such as in response to a centrifugal force and/or an overpressure.

9. An apparatus as set forth in any of the preceding claims 6-8, **characterized in that** the pulper (1) has in connection therewith a supply assembly (X1) for supplying the pulper (1) with a material to be fiberized and/or with one or several additives (XY), such as boric acid, borax and/or the like, particularly for enhancing the thermal/fire resistance properties, decay resistance properties and/or the like of a resulting product, such as pulp wool, wood fiber or the like to be used as thermal insulation, from one or several supply pockets (x11), supply openings (x12) and/or the like, in response to an underpressure provided essentially by the rotary motion (w) of the knife assembly (1a).

10. An apparatus as set forth in any of the preceding claims 6-9, **characterized in that** at least the primary knife unit's (1a') first knife members and/or the secondary knife unit's (1a") knives are designed in the form of elongated and radially disposed vanes (1a'1, 1a"1), having a thickness of 5-20 mm, most preferably 10 mm, and/or that the knife assembly (1a) has a rotation speed (w) within the range of 1500-5000 revolutions per minute, most preferably 3000 revolutions per minute, and/or that the clearance (v) between the secondary knife unit (1a") and the screen assembly (1b) is within the range of 10-50 mm, most preferably 20 mm, and/or that the screen assembly (1b) has a screen capacity within the range of 30-50%, most preferably 40%.